AMENDMENTS TO THE DRAWINGS

The attached "Replacement Sheet" of drawings includes changes to Figure 4. The attached "Replacement Sheet," which includes Figure 4, replaces the original sheet including Figure 4.

In Figure 4, change reference numeral 41 to 41b.

Attachment: Replacement Sheet

REMARKS

Claims 1, 3-7 and 9-12 remain pending in the present application. Claims 2 and 8 have been cancelled. Claims 1 and 7 have been amended. Basis for the amendments can be found throughout the specification, claims and drawings as originally filed.

REJECTION UNDER 35 U.S.C. § 112

Claims 2 and 8 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully traverses this rejection.

Applicant has amended page 3, lines 12-18 to state "the packing member (43, 143, 243) is attached to only the small diameter shaft portion (41b) of the large diameter shaft portion and the small diameter shaft portion." Applicant believes there is adequate support for changing "in" to "of".

First, this change resolves the generally unclear and idiomatically informal manner noted by the Examiner and makes the sentence clear.

Second, enclosed is a machine translation in English of the priority document of the present application. Paragraph 8 is the relevant paragraph in this translation and it reads "Like the invention according to claim 2, door shafts (41) can be provided with a major diameter axis part (41a) and a minor diameter axis part (41b), and only a minor diameter axis part (41b) can be equipped with packing (43, 143, 243) among a major diameter axis part and a minor diameter axis part." Applicant believes that this clearly

supports our position that of the small diameter portion and the large diameter portion, only the small diameter portion is equipped with the packing.

Third, Figure 3 clearly shows that packing 43 is applied to only the small diameter portion (41b) and is not applied to the large diameter portion (41a). This is supported by the specification on page 12, line 32 to page 13, line 11 where it states one packing member 43 covers one portion of the small diameter shaft portion as shown in Figure 3 and the other packing member 43 covers one portion of the small diameter portion (41b). The embodiments in Figure 6 is described on page 16, lines 1-8 and here, packing member 143 covers one portion of the small diameter shaft portion (41b) all over in the circumferential direction of the small diameter shaft (41b). Packing 143 also covers all regions on both sides of the door portion 42.

Thus, Applicant believes the application as originally filed provides support for the claim limitation "only" to the outer surface of the small shaft as discussed above as well as the amending of the specification and drawing to support this limitation. Reconsideration of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-4, 6, 7, 9, 10 and 12 are rejected under 35 U.S.C. § 102(b) as being anticipated by Zexel Corporation (JP 09-58249, made of record via IDS). Applicant has added the limitations of Claim 2 to Claim 1 and Claim 8 to Claim 7.

Thus, Applicant believes Claims 1 and 7, as amended, patentably distinguish over the art of record. Likewise, Claims 3, 4, 6, 9, 10 and 12, which ultimately depend

from Claims 1 or 7, are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

REJECTION UNDER 35 U.S.C. § 103

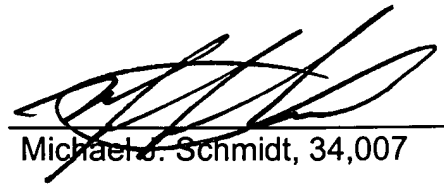
Claims 5 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Zexel Corporation (JP 09-58249, made of record via IDS) in view of Wakamatu, et al. (previously of record). Claims 5 and 11 ultimately depend from Claims 1 and 7, respectively. As discussed above, Claims 1 and 7 have been amended and are now believed to patentably distinguish over the art of record. Thus, Claims 5 and 11 are also believed to patentably distinguish over the art of record. Reconsideration of the rejection is respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: July 7, 2008

By: 
Michael J. Schmidt, 34,007

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

MJS/pmg

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]
In this invention, it is related with the closing mechanism of the passage through which a fluid flows. Therefore, for example, it is suitable for the air mix door device of the air-conditioner for vehicles.

[0002]
[Description of the Prior Art]
Conventionally, in the air-conditioner for vehicles, the cantilever door which has the packing 244 stuck on the door shafts 41 as shown in drawing 8, the tabular door section 42, and the door section 42 as an air mix door which adjusts the mixing ratio of warm air and cold blast, and adjusts blowing off air temperature is used abundantly. And by holding the door shafts 41 in the bearing hole 52 of the case 11, enabling free rotation, and opening and closing the openings 50 and 51 in which air circulates by the door section 42, the rate of the air which passes the 1st opening 50, and the air which passes the 2nd opening 51 is adjusted, and the temperature of the air conditioning style is controlled.
[0003]
[Problem(s) to be Solved by the Invention]
However, since it is necessary to make the door shafts 41 and the bearing hole 52 into a clearance fit, between the door shafts 41 and the bearing hole 52, a crevice certainly occurs, and as the arrow C shows to drawing 8, wind leakage generates them from the crevice. Since it is difficult to generally resin-mold the door shafts 41 and the case 11, and to set up dimensional accuracy severely in resin molding, the crevice between the door shafts 41 and the bearing hole 52 will not be able to be set up small enough, therefore wind leakage will also become large. And under the influence of the wind leakage, as a dashed line showed to drawing 5, the problem that the relation between the opening of the air mix door 40 and the temperature of the air conditioning style did not become linear had occurred.
[0004]
This invention was made in view of the above-mentioned point, and an object of this invention is to decrease the wind leakage from the crevice between door shafts and a bearing hole in the passage closing mechanism which a door rotates focusing on door shafts, and opens and closes the opening of a case.
[0005]
[Means for Solving the Problem]
In order to attain the above-mentioned purpose, in the invention according to claim 1. A door (40) which has a tabular door section (42) which opens and closes door shafts (41) and an opening (50, 51) used as a rotation center, In passage closing mechanism provided with a case (11) where it has

a bearing hole (52) and an opening (50, 51) which hold door shafts (41) enabling free rotation, Either [at least] door shafts (41) or a bearing hole (52) is equipped with packing made from an elastic body (43, 143, 243) which decreases a crevice between door shafts and a bearing hole.

[0006]

According to this, since packing is an elastic body, even if packing contacts door shafts or a bearing hole, a door is rotatable, therefore can set up a crevice between door shafts and a bearing hole small enough, and can decrease wind leakage from the crevice.

[0007]

Since a crevice is decreased by packing, even if it makes a diameter of door shafts thinner than before, there is no influence in the amount of wind leakage, therefore a diameter of door shafts can be made thin. And since a material cost of door shafts decreases by making a diameter of door shafts thin, a part for a cost hike by packing addition can be offset, or it can be made cheaper than before.

[0008]

Like the invention according to claim 2, door shafts (41) can be provided with a major diameter axis part (41a) and a minor diameter axis part (41b), and only a minor diameter axis part (41b) can be equipped with packing (43, 143, 243) among a major diameter axis part and a minor diameter axis part.

[0009]

Like the invention according to claim 3, a door (40) can be equipped with packing (43) and one field of a door section (42) and a part of hoop direction of door shafts (41) can be covered by one packing.

[0010]

It is an air-conditioner for vehicles provided with passage closing mechanism of any one statement of claim 1 thru/or 3 in the invention according to claim 4, It is what is provided with a heat exchanger for air conditioning (12) which cools air, and a heat exchanger for heating (13) which heats air in a case (11) of passage closing mechanism, and is characterized by an opening (50, 51) of passage closing mechanism being a passage where air circulates, Passage closing mechanism of claims 1 thru/or 3 is applicable to an air-conditioner for vehicles.

[0011]

In the invention according to claim 5, a door (40) of passage closing mechanism is characterized by being an air mix door which adjusts an air quantity rate of cold blast cooled by a heat exchanger for air conditioning (12), and warm air heated by a heat exchanger for heating (13).

[0012]

According to this, in order that wind leakage from a crevice between door shafts and a bearing hole may decrease, relation between an opening of an air mix door and temperature of the air conditioning style becomes linear, and the temperature control characteristics of the air conditioning style improve.

[0013]

Numerals in a parenthesis of each above-mentioned means show a correspondence relation with a concrete means of a statement to an embodiment mentioned later.

[0014]

[Embodiment of the Invention]

(A 1st embodiment)

Drawing 1 - drawing 4 show a 1st embodiment, and this embodiment applies the passage closing mechanism concerning this invention to the air-conditioner for vehicles. The expanded sectional view of the A section [in / drawing 1 can be set in the transverse-plane sectional view of the air conditioning unit part of the air-conditioner for vehicles, and / in drawing 2 / drawing 1], the flat-surface sectional view of the A section [in / in drawing 3 / drawing 1], and drawing 4 are sectional views which meet the B-B line of drawing 3.

[0015]
The air-conditioner for vehicles of this embodiment is independently controllable in the blowing off air temperature by the side of a front seat, and the blowing off air temperature by the side of a backseat. The ventilation system of this air-conditioner for vehicles was divided roughly, and is divided into two portions of the air conditioning unit 10 and the blower unit (not shown) which ventilates this air conditioning unit 10 in air. The blower unit is offset and arranged from the center section among the instrument board lower parts of the car interior of a room to the passenger side, on the other hand the air conditioning unit 10 is arranged among the instrument board lower parts of the car interior of a room at the approximately center part of the vehicle longitudinal direction.
[0016]
The blower unit comprises a fan which inhales air and ventilates through the inside-and-outside mind change box which carries out change introduction of vehicle outdoor air and the vehicle indoor air, and this inside-and-outside mind change box like common knowledge.
[0017]
In drawing 1, the air conditioning unit 10 is a thing of the type with which both build in the evaporator 12 and the heater core 13 in one in the air conditioning case 11 made of resin. The air conditioning unit 10 is arranged to the cross direction and sliding direction of vehicles in the loading direction shown by the arrow of drawing 1 at the approximately center part of the instrument board lower part of the car interior of a room. An evaporator is equivalent to the heat exchanger for air conditioning of this invention, and the heater core 13 is equivalent to the heat exchanger for heating of this invention.
[0018]
the air conditioning case 11 -- the air inlet 14 is most formed in the side of the part by the side of a vehicle front. Blowing air from the case outlet of the fan of a blower unit flows into this air inlet 14.
[0019]
In the air conditioning case 11, the evaporator 12 is arranged at the part just behind the air inlet 14. This evaporator 12 is arranged at the abbreviated perpendicular so that an air conditioning case 11 secret-communication way may be crossed with a thin gestalt to a vehicles cross direction. Therefore, blowing air from the air inlet 14 flows into the front face prolonged in the vehicles sliding direction of the evaporator 12. Like common knowledge, this evaporator 12 carries out the endothermic of the latent heat of vaporization of the refrigerant of a refrigerating cycle from air conditioning, and cools air conditioning.
[0020]
And a predetermined interval is opened in the air flow downstream side (vehicles back side) of the evaporator 12, and the heater core 13 is arranged. This heater core 13 carries out a certain quantity inclination, and is arranged at the vehicles back side at the lower part side within the air conditioning case 11. The width dimension of the vehicle longitudinal direction of the evaporator 12 and the heater core 13 is designed by the width dimension and abbreviated EQC of the air conditioning case 11.
[0021]
The cold blast which passed the evaporator 12 is reheated, hot warm water (engine cooling water) flows into that inside, and the heater core 13 heats air by making this warm water into a heat source. The heater core 13 has the core part 13a for heat exchange which consists of a flat tube which warm water passes like common knowledge, and a corrugated fin joined to this, The airstream way of this core part 13a for heat exchange is divided into the upper channel 16 for front seats, and the lower channel 17 for backseats by the diaphragm 15. The diaphragm 15 is formed so that it may be arranged at the air flow upstream of the heater core 13 and may extend covering the overall length of the vehicle longitudinal direction of air conditioning case 11 building envelope.
[0022]
In the air duct within the air conditioning case 11, the cool air bypass passage 119 for front seats

which bypasses this heater core 13 and through which air (cold blast) flows is formed in the upper part part of the heater core 13.

[0023]

In the part between the heater core 13 and the evaporator 12, the plate-like air mix door 20 for front seats is arranged. This air mix door 20 for front seats adjusts the air quantity rate of the warm air heated in the channel 16 for front seats of the core part 13a for heat exchange of the heater core 13, and the cold blast which bypasses the heater core 13 through the cool air bypass passage 19 for front seats.

[0024]

It is horizontal, and is combined with the axis of rotation 21 and one which have been arranged in the vehicle longitudinal direction, and the air mix door 20 for front seats is rotatable independently centering on this axis of rotation 21 in the vehicles sliding direction. The axis of rotation 21 is supported by the air conditioning case 11, enabling free rotation, and the end part of the axis of rotation 21 is projected to the exterior of the air conditioning case 11, Via the link mechanism which is not illustrated, it connects with the actuator mechanism using a servo motor, and the rotating position of the air mix door 20 is adjusted with this actuator mechanism.

[0025]

In the air conditioning case 11, integral moulding of the wall surface 22 which opens a prescribed interval in the part of the air downstream (vehicles back side) of the heater core 13 between the heater cores 13, and is prolonged in a sliding direction is carried out to the air conditioning case 11. The warm air passage 23 for front seats which goes to the upper part from immediately after the heater core 13 by this wall surface 22 is formed.

[0026]

The downstream (upper part side) of the warm air passage 23 for front seats joins the downstream of the cool air bypass passage 19 in the upper portion of the heater core 13, and forms the air mixture section 24 for front seats which performs mixing of cold blast and warm air.

[0027]

In the upper face part of the air conditioning case 11, the defroster opening 25 is carrying out the opening to the part which adjoins the air mixture section 24 for front seats. The air conditioning by which temperature control was carried out from the air mixture section 24 flows, it is connected to a defroster outlet via the defroster duct which is not illustrated, and this defroster opening 25 blows off a wind from this defroster outlet towards the inner surface of a vehicle front windowpane.

[0028]

The defroster opening 25 is opened and closed by the plate-like defroster door 26. This defroster door 26 rotates as a center the axis of rotation 27 horizontally arranged near the upper face part of the air conditioning case 11.

[0029]

The defroster door 26 carries out the change opening and closing of the defroster opening 25 and the interconnecting opening 28. This interconnecting opening 28 serves as a passage for passing the air conditioning wind from the air mixture section 24 to the below-mentioned face opening part 29 for front seats, and foot opening part 30 side for front seats.

[0030]

In the upper face part of the air conditioning case 11, the face opening part 29 is formed in the part by the side of vehicles back (crew member slippage) rather than the defroster opening 25, and this face opening part 29 via the face duct which is not illustrated, It is connected to the face outlet arranged at the instrument board upper part side, and a wind is blown off towards the crew head part of this face outlet empty vehicle interior of a room.

[0031]

In the air conditioning case 11, the foot opening part 30 is formed in the lower part side of the face opening part 29. The air conditioning wind which passed this foot opening part 30 blows off to a

crew member step via the foot duct which is not illustrated.
[0032]
The plate-like door 31 for a foot face change is arranged rotatable with the axis of rotation 32 between the face opening part 29 and the foot opening part 30. The change opening and closing of the face opening part 29 and the foot opening part 30 are carried out by this door 31 for a change.
[0033]
The defroster door 26 and the door 31 for a foot face change are connected with the common actuator mechanism which consists of servo motors via the link mechanism which is not illustrated, and interlocking operation is carried out by this actuator mechanism.
[0034]
In the inside of the air conditioning case 11, the cool air bypass passage 34 for backseats which bypasses the heater core 13 and passes the cold blast from evaporator 12 exit is formed in the lower part side part of the heater core 13.
[0035]
In the air downstream part of the heater core 13, the warm air shielding door 35 for backseats is arranged rotatable with the axis of rotation 36 so that the channel 17 for backseats may be countered. Usually it is operated in the real line position of drawing 1 at the time, this warm air shielding door 35 for backseats intercepts a free passage with the channel 17 for backseats of the heater core 13, and the warm air passage 23 for front seats, and the channel 17 for backseats is opened for free passage to the warm air passage 37 for backseats.
[0036]
On the other hand, in the specific operating condition of an air-conditioner, the warm air shielding door 35 for backseats intercepts a free passage with the channel 17 for backseats, and the warm air passage 37 for backseats, and opens the channel 17 for backseats for free passage to the warm air passage 23 for front seats. The warm air passage 37 for backseats is a passage which makes the air mixture section 38 for backseats open the downstream of the channel 17 for backseats of the heater core 13 for free passage.
[0037]
The axis of rotation 36 of the warm air shielding door 35 for backseats is connected with the actuator mechanism which consists of servo motors via the link mechanism which is not illustrated, and rotating operation of the warm air shielding door 35 for backseats is carried out with this actuator mechanism.
[0038]
The plate-like air mix door 40 for backseats is arranged rotatable with the axis of rotation 41 to the part by the side of the channel 17 for backseats among the upstream of the heater core 13.
[0039]
Near the air mix door 40 for backseats in the air conditioning case 11, The 1st opening 50 that makes the air flow downstream side of the evaporator 12 and the channel 17 for backseats of the heater core 13 open for free passage, and the 2nd opening 51 that makes the air flow downstream side and the cool air bypass passage 34 for backseats of the evaporator 12 open for free passage are formed.
[0040]
And when the air mix door 40 for backseats adjusts the opening of the 1st opening 50 and the 2nd opening 51, It is what adjusts the temperature of the air conditioning style which adjusts the air quantity rate of the warm air which passes through the channel 17 for backseats of the heater core 13, and the cold blast which passes through the cool air bypass passage 34 for backseats, and blows off to the vehicle indoor backseat side, It mixes in the air mixture section 38 for backseats, and the warm air from the warm air passage 37 for backseats and the cold blast from the cool air bypass passage 34 for backseats serve as air of desired temperature.
[0041]

Next, based on drawing 2 – drawing 4, the composition of the air mix door 40 for backseats and the composition of the neighborhood are explained in full detail.

[0042]

The air mix door 40 for backseats consists of the packing 43 of two sheets made from a wrap elastic body the plate-like door section 42 which opens and closes the axis of rotation 41 held enabling the free rotation to the bearing hole 52 formed in the air conditioning case 11, and the 1st opening 50 and the 2nd opening 51, and the axis of rotation 41 and the door section 42.

[0043]

The axis of rotation 41 has the shape with the stage of having the major diameter axis part 41a and the minor diameter axis part 41b, and the cross shape engaging hole 41c is formed in the end by the side of the major diameter axis part 41a. This axis of rotation 41 is horizontal, and is arranged in the vehicle longitudinal direction. The axis of rotation 41 is equivalent to the door shafts of this invention.

[0044]

The air mix door 40 for backseats is connected with the actuator mechanism using the servo motor etc. which are not illustrated via the link mechanism 60, and adjusts the rotating position of the air mix door 40 for backseats with this actuator mechanism.

[0045]

The link mechanism 60 has Itabe 61 and the shank 62, and the claw part 63 and the cross shape engagement piece 64 are formed in the shank 62. And the shank 62 is inserted in the through hole of the air conditioning case 11, and the omission of the shank 62 is prevented by the claw part 63. The engagement piece 64 is inserted in the engaging hole 41c, and the air mix door 40 for backseats and the link mechanism 60 rotate to one.

[0046]

Integral moulding of the axis of rotation 41 and the door section 42 is carried out by resin, such as polypropylene. The packing 43 will change easily, if external force is received, and if external force is removed, it is formed with the construction material which has the characteristic which returns to the original shape. Specifically as construction material of the packing 43, urethane foam etc. can be used for porosity foam and the details of a twist.

[0047]

The packing 43 of two sheets is stuck on the axis of rotation 41 and the door section 42, and one packing has covered a part of minor diameter axis part 41b periphery of the door shafts 41 for the whole region of one field of the door section 42 with the wrap. More, in details, one packing has covered some ranges of the hoop direction in the minor diameter axis part 41b, as are shown in drawing 3, and some ranges of the shaft orientations in the minor diameter axis part 41b are covered and it is shown in drawing 4. Similarly, packing of another side has covered some ranges of shaft orientations [in / for the whole region of the field of another side of the door section 42 / in a wrap / the minor diameter axis part 41b], and has covered the range of the remainder of the hoop direction in the minor diameter axis part 41b.

[0048]

In the packing 43, a wrap portion is located between the door shafts 41 and the bearing hole 52 in the periphery of the door shafts 41, and it has the function to decrease the wind leakage from the crevice, by decreasing the crevice between the door shafts 41 and the bearing hole 52.

[0049]

As for the air-conditioner for vehicles which becomes the above-mentioned composition, the blow-off mode by the side of a front seat is set up as everyone knows by control of the defroster door 26 and the door 31 for a foot face change. And the temperature of the air conditioning style which blows off to the front seat side is controlled by adjusting with the air mix door 20 for front seats the air quantity rate of the cold blast which passes through the cool air bypass passage 19, and the warm air heated by flowing into the channel 16 for front seats of the heater core 13.

[0050]
The temperature of the air conditioning style which blows off to the backseat side is controlled by adjusting with the air mix door 40 for backseats the air quantity rate of the warm air which passes through the channel 17 for backseats of the heater core 13, and the cold blast which passes through the cool air bypass passage 34 for backseats. That is, the independent control of the blow off temperature by the side of a front seat and a backseat can be carried out by carrying out independent control of the opening position of the air mix door 20 for front seats, and the air mix door 40 for backseats.
[0051]
Here, in order to decrease the periphery of the door shafts 41 by the wrap portion in the packing 43, the wind leakage from the crevice decreases the crevice between the door shafts 41 of the air mix door 40 for backseats, and the bearing hole 52 of the air conditioning case 11. The result checked in the experiment that the relation between the opening of the air mix door 40 for backseats and the temperature of the backseat air conditioning style became linear.
[0052]
It was the tendency for drawing 5 to show the experimental result and for the opening of the air mix door 40 for backseats to become lower than the temperature which the temperature of the backseat air conditioning style expects at nearly 60% in the conventional air-conditioner under the influence of the wind leakage from the crevice between the door shafts 41 and the bearing hole 52. On the other hand, in the air-conditioner of this example, the opening of the air mix door 40 for backseats becomes close to the temperature which the temperature of the backseat air conditioning style in nearly 60% expects, and the opening of the air mix door 40 for backseats in 40 to 80% of range. It was checked that the relation between the opening of the air mix door 40 for backseats and the temperature of the backseat air conditioning style becomes almost linear.
[0053]
As mentioned above, in this embodiment, since the periphery of the door shafts 41 is decreasing the crevice between the door shafts 41 and the bearing hole 52 by the wrap portion in the packing 43, the wind leakage from the crevice can be decreased.
[0054]
When wrap composition is applied to the air mix door 40 by packing, the relation between the opening of the air mix door 40 and the temperature of the air conditioning style becomes linear, and the temperature control characteristics of the air conditioning style improve the periphery of door shafts.
[0055]
Since the packing 43 is an elastic body, even if the packing 43 contacts the bearing hole 52, it will be rotatable, therefore it can set up small enough the crevice between the door shafts 41 and the bearing hole 52, and can decrease the wind leakage from the crevice. [of the door 40]
[0056]
Since a crevice is decreased by the packing 43, even if it makes the path of the door shafts 41 thinner than before, there is no influence in the amount of wind leakage, therefore the path of the door shafts 41 can be made thin. And since the material cost of the door shafts 41 decreases by making the path of the door shafts 41 thin, a part for the cost hike by addition of the packing 43 can be offset, or it can be made cheaper than before.
[0057]
(A 2nd embodiment)
Drawing 6 shows a 2nd embodiment, the composition of packing differs from a 1st embodiment, and other points are the same as that of a 1st embodiment.
[0058]
In this embodiment, the number of the packing 143 stuck on the air mix door 40 is one. That is, while some ranges of the shaft orientations in the minor diameter axis part 41b of the door shafts 41 are

covered by this packing 143 of one sheet over the whole region of the hoop direction in the minor diameter axis part 41b, the double-sided whole region of the door section 42 is covered.
[0059]
And in order for the periphery of the door shafts 41 to decrease the crevice between the door shafts 41 and the bearing hole 52 by the wrap portion in the packing 143, the same effect as a 1st embodiment is acquired.
[0060]
(A 3rd embodiment)
Drawing 7 shows a 3rd embodiment, the composition of packing differs from a 1st embodiment, and other points are the same as that of a 1st embodiment.
[0061]
According to this embodiment, the door section packing 244 of two wraps is used for the long and slender shank packing 243 of shape stuck on the peripheral part of the minor diameter axis part 41b, one field of the door section 42, and the field of another side as packing stuck on the air mix door 40, respectively. The shank packing 243 has covered some ranges of the shaft orientations in the minor diameter axis part 41b, and has covered some ranges of the hoop direction in the minor diameter axis part 41b.
[0062]
And in order to decrease the crevice between the door shafts 41 and the bearing hole 52 with the shank packing 243, the same effect as a 1st embodiment is acquired.
[0063]
The shank packing 243 is abolished, and the same effect is acquired even if it equips with the shank packing 243 and packing of the same shape and size the part which counters the minor diameter axis part 41b in the inner skin of the bearing hole 52.
[0064]
(Other embodiments)
Although each above-mentioned embodiment showed the example which applies this invention to the air mix door 40 for backseats, This invention can be applied also to the air mix door 20 for front seats, and can be further applied to the defroster door 26, what is called a mode door of the door 31 grade for a foot face change, the inside-and-outside mind door for carrying out change introduction of vehicle outdoor air and the vehicle indoor air, etc.
[0065]
Although each above-mentioned embodiment showed the example which applies this invention to the door which has the axis of rotation 41 of the shape with the stage of having the major diameter axis part 41a and the minor diameter axis part 41b, this invention is applicable also to the door which has the axis of rotation which is not shape with the stage.
[0066]
This invention is widely [as closing mechanism of a fluid channel] applicable also to uses other than the air-conditioner for vehicles.
[Brief Description of the Drawings]
[Drawing 1]It is a transverse-plane sectional view of the air conditioning unit part of the air-conditioner for vehicles which applied the passage closing mechanism which becomes a 1st embodiment of this invention.
[Drawing 2]It is an expanded sectional view of the A section in drawing 1.
[Drawing 3]It is a flat-surface sectional view of the A section in drawing 1.
[Drawing 4]It is a sectional view which meets the B-B line of drawing 3.
[Drawing 5]It is a characteristic figure showing the relation between a backseat air mix door opening and the degree of backseat air conditioning warm air.
[Drawing 6]It is a sectional view of an important section showing a 2nd embodiment of this invention.

[Drawing 7]It is a sectional view of an important section showing a 3rd embodiment of this invention.

[Drawing 8]It is a sectional view showing a device conventionally.
[Description of Notations]
11 [-- Door section] -- An air conditioning case, 40 -- A door, 41 -- Door shafts, 42
43, 143, 243 -- Packing, 50, 51 -- Opening.

[Translation done.]